

IAA Correlator Center

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Abstract

The activities of the six-station IAA RAS correlator include regular processing of national geodetic VLBI programs Ru-E, Ru-U, and Ru-F. The Ru-U sessions transferred in e-VLBI mode and correlated in the IAA Correlator Center automatically since 2011.

1. Introduction

The IAA Correlator Center is located at and staffed by the Institute of Applied Astronomy in St.-Petersburg, Russia.

The IAA Correlator Center is devoted to processing geodetic, astrometric, and astrophysical observations made with the Russian national VLBI network Quasar.



Figure 1. View of the six-station ARC correlator, showing four racks containing (left to right) signal distribution and synchronization system (SDSS) and three Mark 5B playback units, two correlator crates and KVM, three correlator crates, and one more cabinet with SDSS and three Mark 5B playback units.

2. Component Description

The ARC (Astrometric Radiointerferometric Correlator) (Figure 1) was the main data processing device in the IAA Correlator Center in 2011. The ARC was designed and built in the IAA RAS in 2007 - 2009. The correlator has XF design and is based on FPGA technology.

The ARC is a six-station, 15-baseline correlator. It is able to process up to 16 frequency channels on each baseline, for a total of 240 channels. The correlator accesses two-bit VLBI signals with 32 MHz maximal clock frequency. The maximal data range from each station is 1 Gbit per second. The correlator requires VSI-H input VLBI signals, and it is equipped with Mark 5B playback terminals.

In 2011 the correlator control software was improved to obtain almost fully automatic data transfer and processing in e-VLBI mode. Special software corrections were made due to the use of R1002M DAS at Quasar stations.

The ARC was used for processing all of the national geodetic VLBI observations in the IAA Correlator Center in 2011.

In 2011 the DiFX software correlator was installed in the IAA on a Sun Fire X4450 Server. The DiFX works as a virtual machine under the VMware, and it is used in some astrophysical experiments.

3. Staff

- Voitsekh Ken — hardware developer;
- Alexey Melnikov — software developer, scheduler of the Ru-sessions;
- Vladimir Mishin — software developer, data processing;
- Nadezda Sokolova — software developer;
- Violet Shantyr — software developer, post processing;
- Igor Surkis — leading investigator, software developer;
- Vladimir Zimovsky — hardware developer, data processing;
- Ekaterina Medvedeva — data processing.